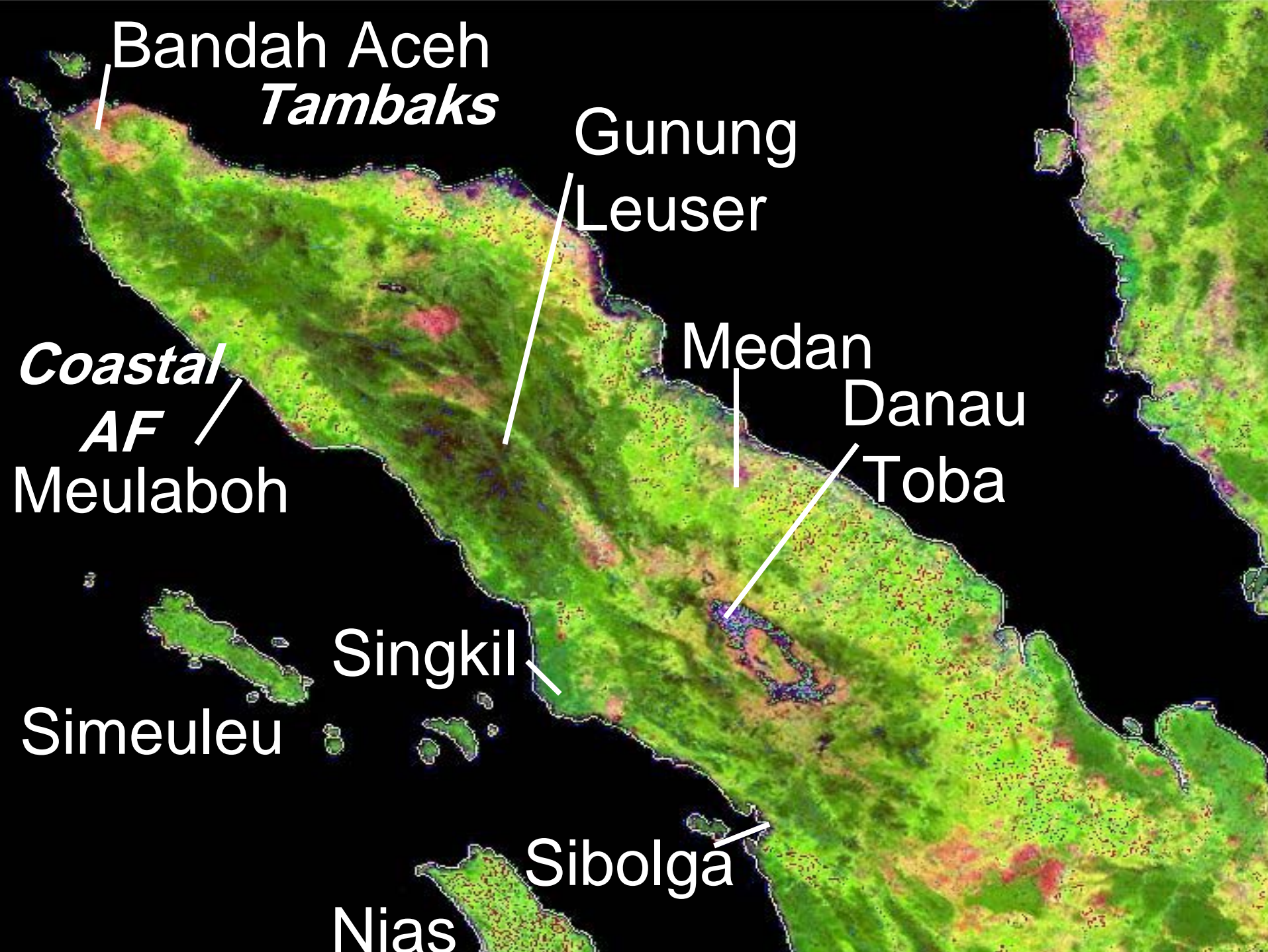


Sources of livelihood resilience in post-Tsunami Aceh: property rights, collective action and environmental service provision



Suseno Budidarsono¹, Meine van Noordwijk¹,
Indra Zainun², Laxman Joshi¹, Ery Nugraha¹,
Anggoro Santoso¹, Chip Fay¹

1. World Agroforestry Centre, ICRAF-SEA, Bogor, Indonesia
2. Syah Kuala University, Banda Aceh, Indonesia



Bandah Aceh
Tambaks

Gunung
Leuser

Medan

Danau
Toba

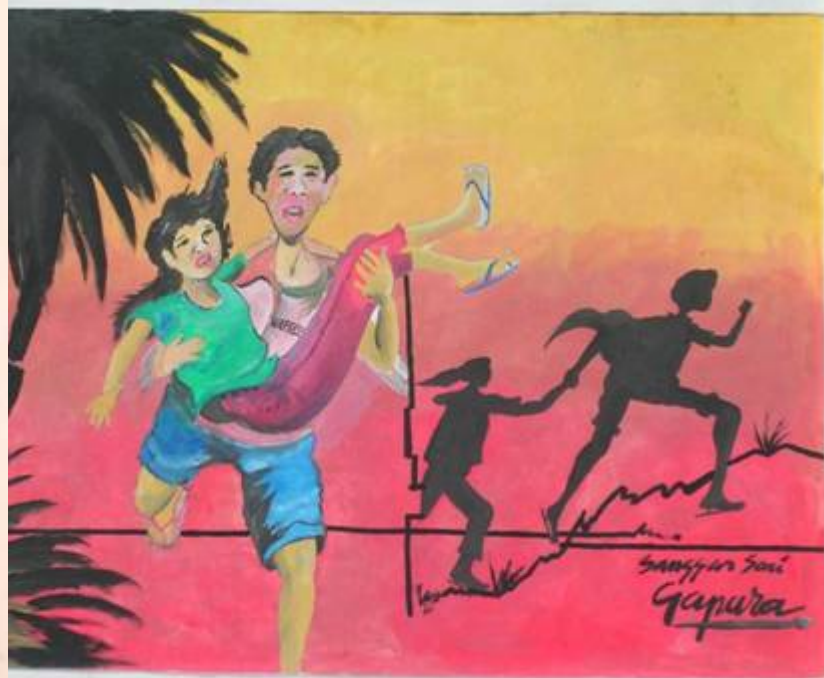
Coastal
AF
Meulaboh

Singkil

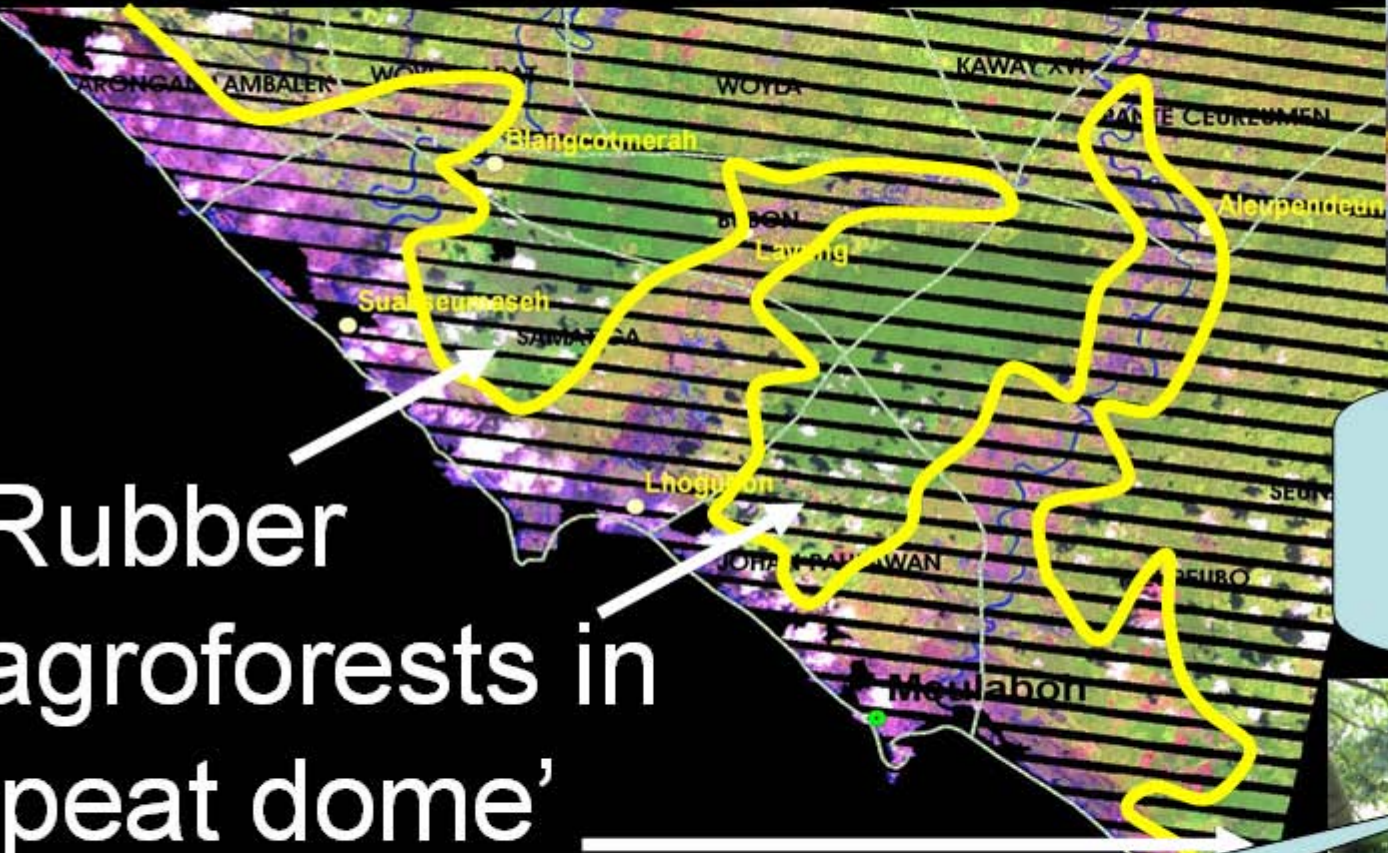
Simeuleu

Sibolga

Nias



Tsunami Damage West Aceh



Rubber agroforests in peat dome wetlands



When the waves came I climbed the rubber trees



Today we started to tap the trees







Stage

Rescue, assist

Immediate relief: shelter, water, food, security, family networks

Help recuperate from shock & trauma, help assess options in new situation

Help rebuild livelihoods, rehabilitate infrastructure & landscape

Learn lessons: prevention elsewhere

Forget and integrate into ‘business as usual’



WOYLA BARAT WOYLA TIMUR

ARONGAN LAMBALEK

WOYLA

SEUNAGAN TIMUR

BUBON

SAMATIGA

MEUREUBO

JOHAN PAHLAWAN

SEUNAGAN

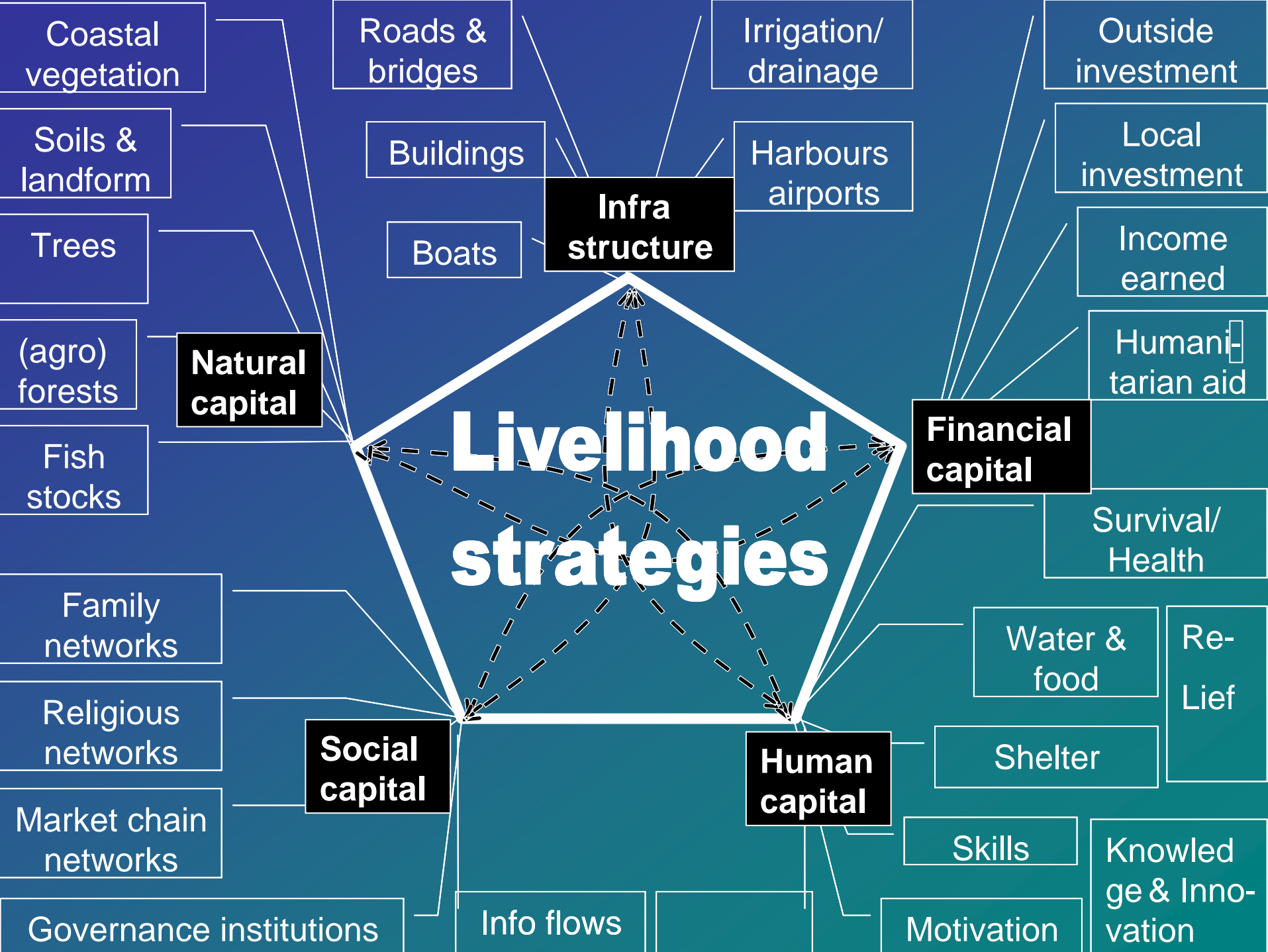
KUALA



May 2005

Survivors around
Meulaboh: start
to tap rubber
trees & plant new
coconut – without
any external
support so far...

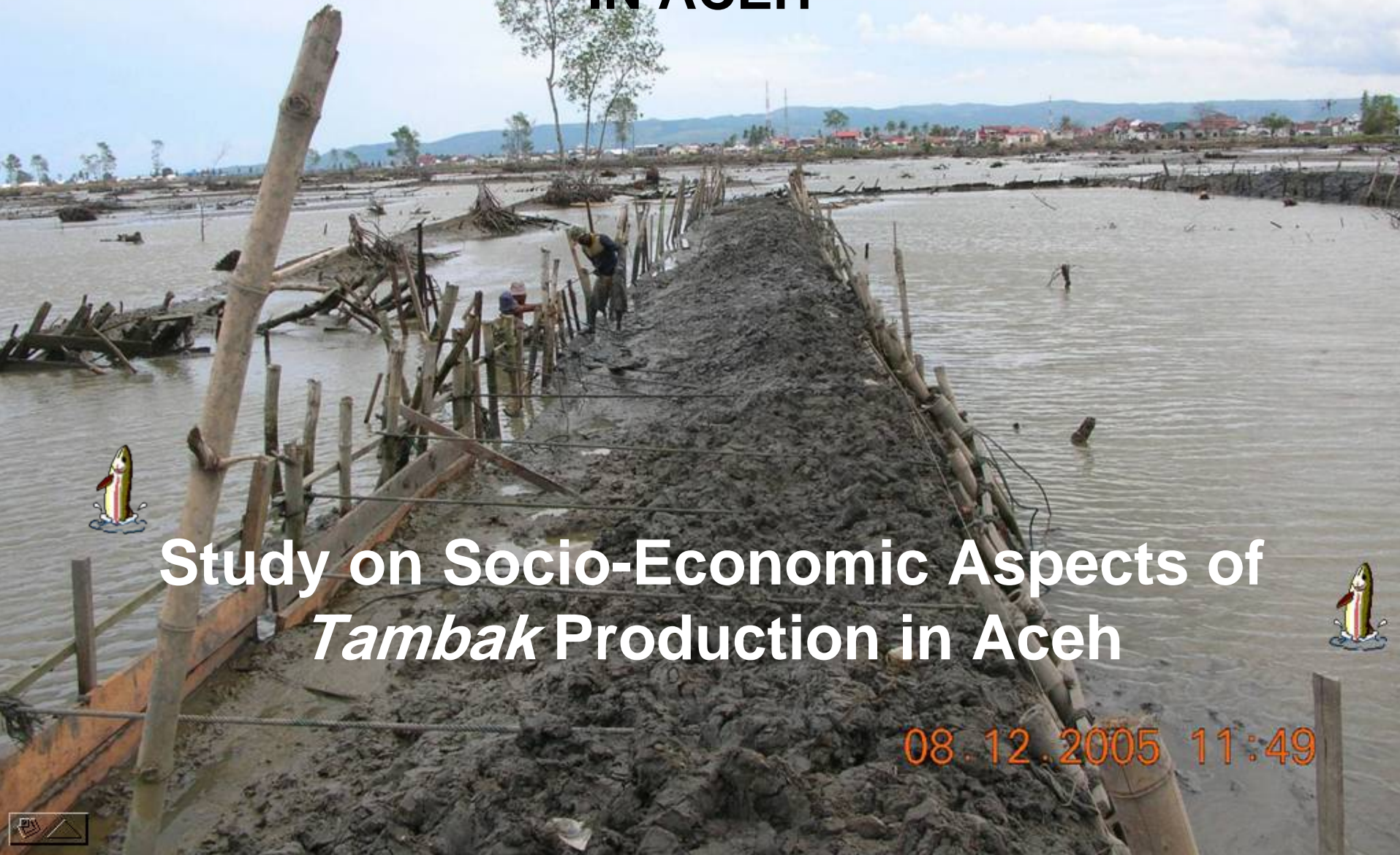




Sources of resilience

- **Trees** > **People**
- **Agroforests** > **Market access**
- **Social networks
(family, religion)** > **Market chain
solidarity**

WHO CONTROLS AND BENEFITS FROM *TAMBAK* (BRACKISH WATER AQUACULTURE) IN ACEH



Study on Socio-Economic Aspects of
Tambak Production in Aceh



08.12.2005 11:49



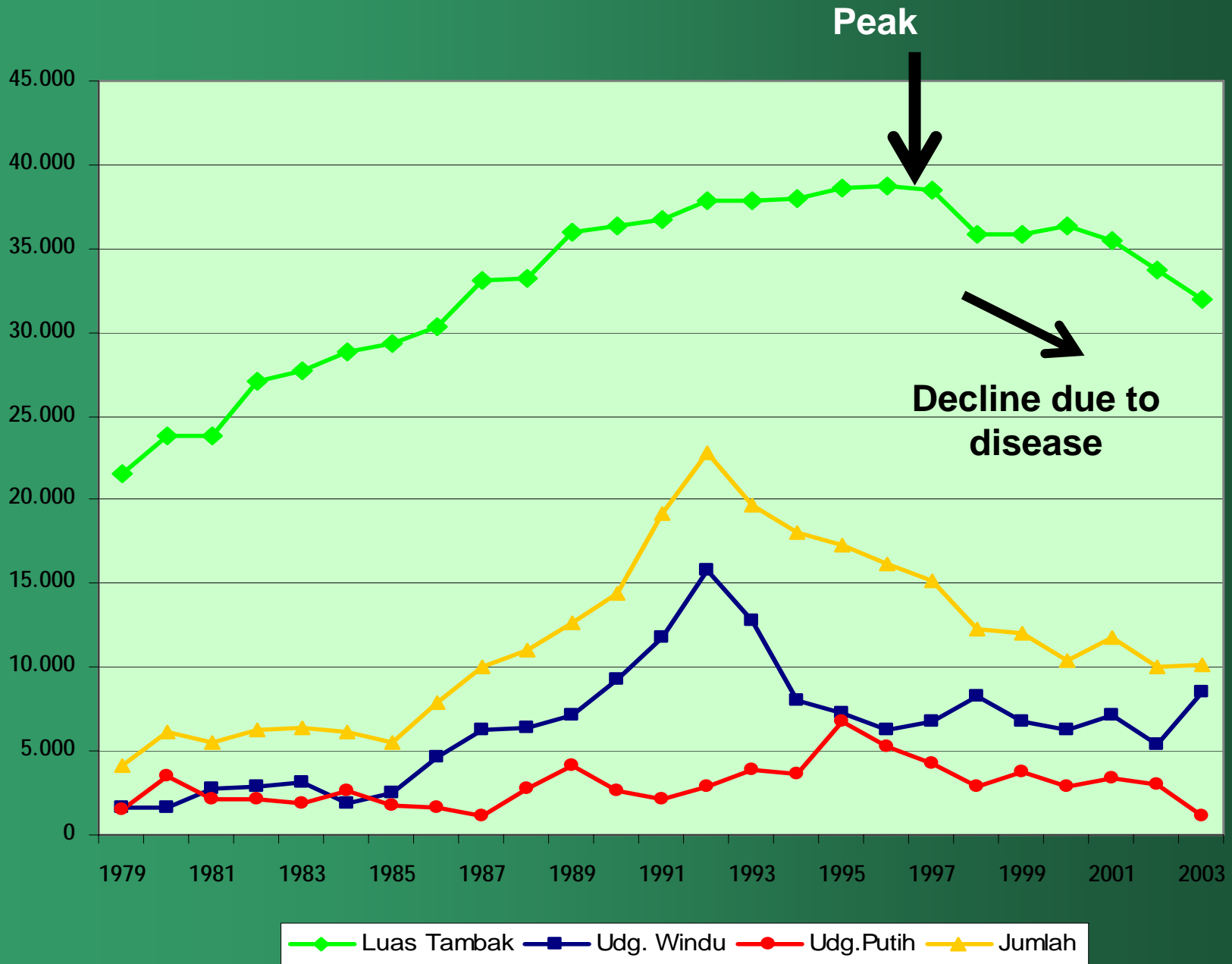
Tambak – derived from mangrove?

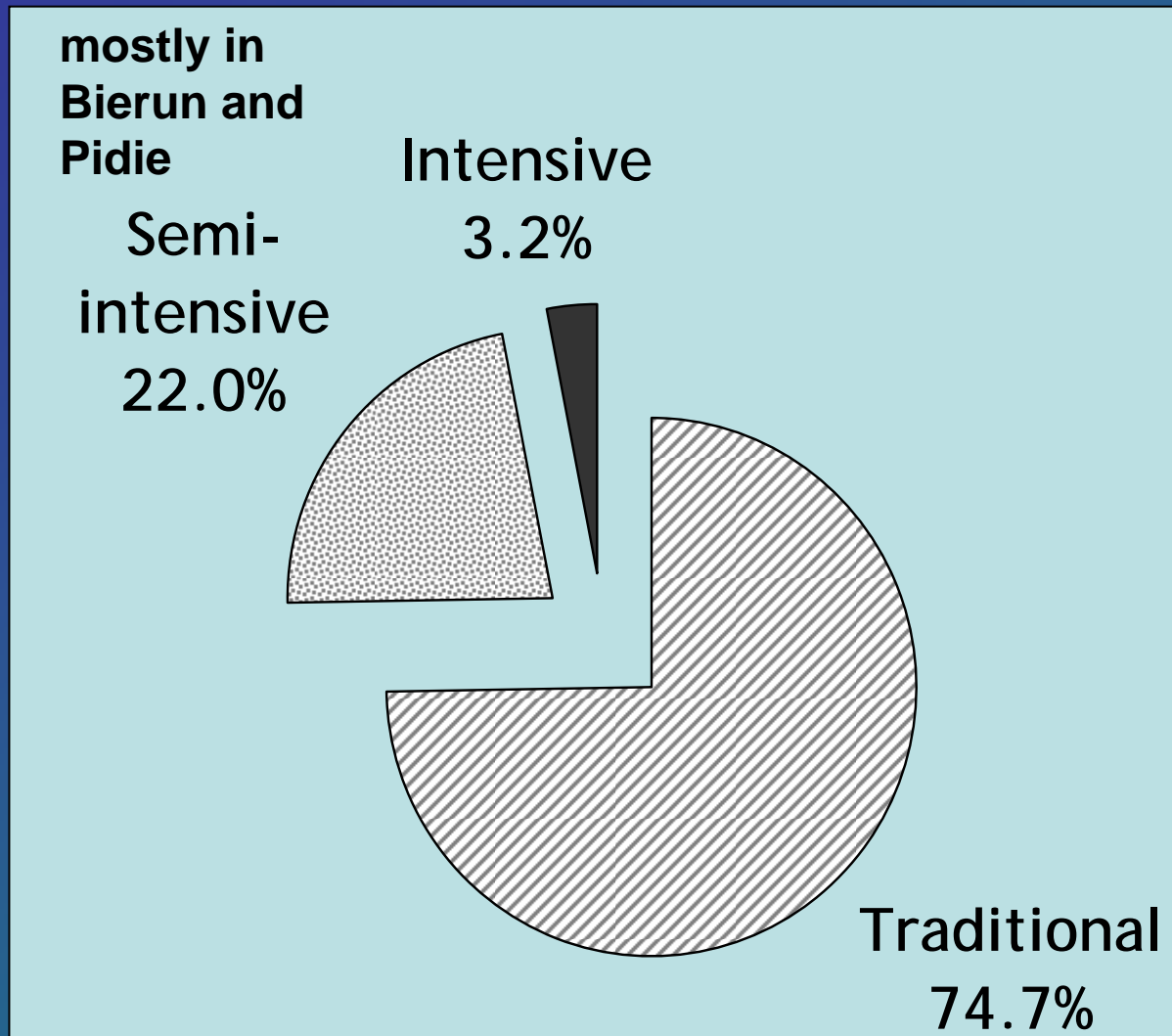
The majority of the brackish-water ponds in Bireun, Pidie, Aceh Utara, and Lhokseumawe are **converted paddy fields**.

Ponds in other areas like Banda Aceh, Aceh Besar are usually converted from mangrove forest with a substrate of mud.

Extensive conversion of mangrove forest for shrimp farming in Aceh, began in early 1960's, when a Medan based investor provided credit scheme for shrimp culture to groups of 40 farmers.

Tambak Area and Production in NAD Province 1979 - 2003



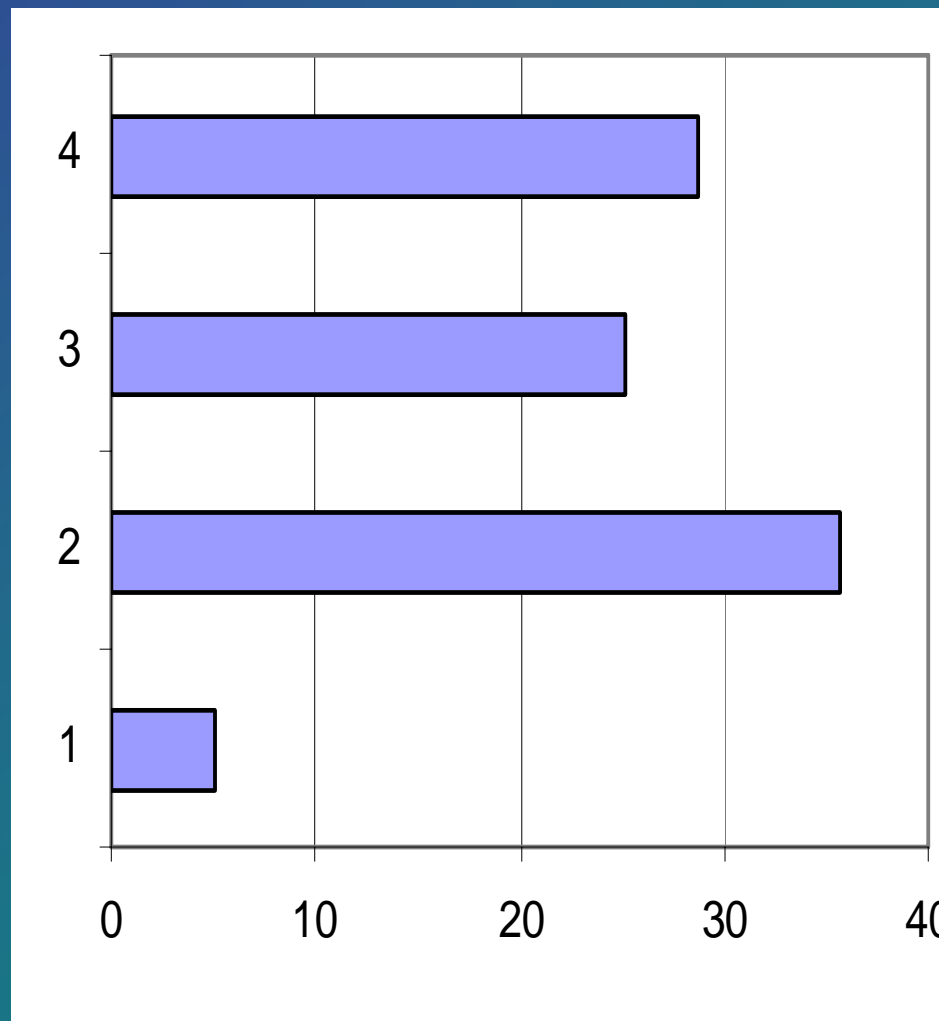


Brackish-water pond in NAD by technology, 2004

Source : Dinas Perikanan
Propinsi NAD

FAO physical damage assessment

- (4) Minor or light damage to dykes (<20% dykes destroyed, or eroded) and associated infrastructure;
- (3) moderate damage (partial loss of embankment and its associated infrastructures; 25% to-50%);
- (2) heavily damage (greater then 50% of embank-ment and infrastructures loss resulting in loss of the physical structure of the *tambak* and associated infrastructure);
- (1) complete loss of ponds;



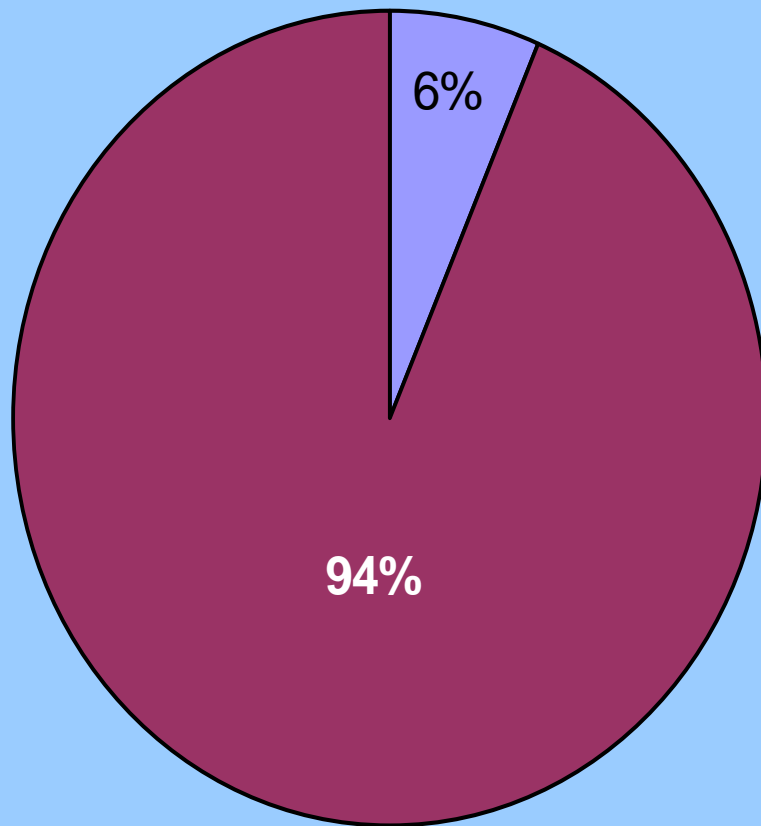
No data: loss of all working capital..

STUDY SITES



CODE	DISTRICT	SUB-DISTRICT	VILLAGE
08	ACEH BESAR	Mesjid Raya	Lamnga, Gampong Baro, Neuheun
09	PIDIE	Kembang Tanjong Bandar Baru	Lancang Baroh Lancok
10	BIREUEN	Samalanga Jeunib	Mns. Lancok Teupin Kupula
11	ACEH UTARA	Seuneudon	Matang Lada
71	BANDA ACEH	Kuta Alam Syiah Kuala	Lambaro Skep Tibang
74	LHOKSUM AWE	Blang Mangat	Kuala Meuraksa

Owners and communities



- Number of owners
- Number of people rely on Tambak

TAMBAK AQUACULTURE : MAIN ACTORS

In the selected villages

Toke	27
Tambak owner	834
Number of households	2.712
Number of people	12.285
	1.433,15
Tambak area (ha)	ha

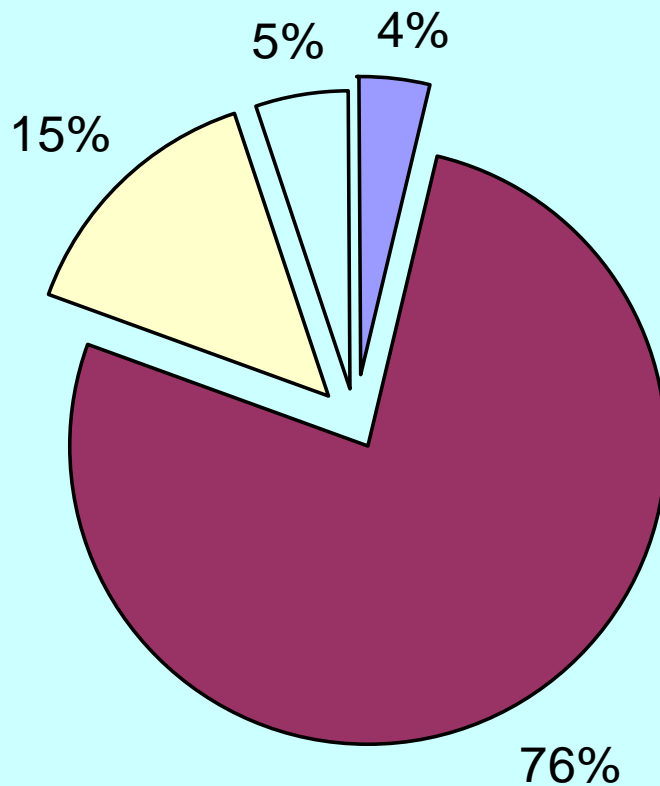
There are considerably more people involved directly or indirectly dependant on aquaculture as part of their livelihood strategies

hatchery operators and employees,

•feed suppliers and salespeople

•people involved in trading, marketing and services

Tambak Management



- Owner Operator with self finance
- Owner-operator, rely on toke for working capital
- Operator renting in the pond with self finance
- Operator working for the owner

December 2005 appraisal in 12 villages in the six regencies with largest *tambak* area (Banda Aceh, Aceh Besar, Pidie, Bireun, Lhok Seumawe, and Aceh Utara)

- 2,722 households relied their livelihood on 1,433 ha *tambak* : **0.5 ha/household:**
(395 – 813 person-days per hectare per year)
- **92%** of *tambak* farmers rely on local middlemen (*toke*) who provide working capital and serve as marketing agent. By the disaster, *toke* also lost their capital and *tambak* farmers whose ponds were damaged are not be able to restore their *tambak* themselves.

December 2005 survey in 12 villages along N & E coast

19.8% of the *tambak* is on 'non-private' land.

But, only 36.5% for the privately owned land with *tambak* is covered by a land certificate.

Most of the certified ownership is in the urban area close to Banda Aceh (Tibang and Lambaro skeep, 99.5% and 44.9% respectively) and Pidie (Baroh Lancok, 43.9%). Elsewhere certification is less than 15%.

Financial parameters of tambak rehabilitation	Level of damage due to tsunami				
	Severely damaged capital intensive	Medium damage		Minor damage	
		capital intensive	labor intensive	capital intensive	labor intensive
Estimate of rehabilitation cost (Rp 000 per ha)	32,414	20,917	12,366	12,373	5,886

Potential returns to labour are interesting, despite investment needs

Scenario calculations (NPV) for 3 farm types



Substantial capital investment is needed

Private profitability of tambak is high....

But **social** costs are not included in this calculation:

- Loss of fish production
- Loss of coastal protection function: enhanced probability of X-000 deaths once in Y-000 years

Is this a failure of local institutions?

Can collective benefits off-set private gains?

Is there any local activity that can compete with tambak in returns to labour??

Conclusion

- Tambak provide rural employment and generate income for rural economy
- Tambak owners does not always controlling tambak production
- Tambak rehabilitation would accelerate the economy of tsunami affected area

Terima Kasih



15.12.2005 13:15

